Podocarpus falcatus

Jøker, Dorthe

Published in:
Seed Leaflet

Publication date:
2003

Document version
Publisher's PDF, also known as Version of record

SEED LEAFLET

No. 75 May 2003

Podocarpus falcatus (Thunb.) R.Br. ex Mirb.

Taxonomy and nomenclature

Family: Podocarpaceae

Synonyms: *Afrocarpus dawei* Stapf, *A. falcata* (Thunb.) C.N. Page, *A. gracilior* (Pilger) C.N. Page, *A. usambarensis* (Pilger) C.N. Page, *Decussocarpus falcatus* (Thunb.) de Laubenfels, *D. gracilior* (Pilger) de Laubenfels, *Nageia falcata* (Thunb.) Kuntze, N. meyeriana (Endl.) Kuntze, *Podocarpus elongatus* L Herit ex Pers., *P. gracilior* Pilger, *P. gracillimus* Stapf, *P. meyeriana* Endl., *Podocarpus usambarensis* Pilger, *P. usambarensis* var. *dawei* Melville, *Taxus falcata* Thunb.

Vernacular/common names: East African yellowwood, outeninqua yellowwood (Eng.); zigba (Ethiopia); mse mawe, olvirviri, owiriwiri (Tanzania); musenene, obwipe, omufu (Uganda); outeniekwageelhout, umsonti (Africaans); umSonti (Zulu); podo (trade name).

Distribution and habitat

Native to East and Southern Africa from Sudan in the north, west to Congo and south to the Cape province. It is found in various types of vegetation, including Afromontane forest. In Afromontane forest it is frequently one of the dominant or co-dominant species ('Podocarpus forest' or e.g. Juniperus-Podocarpus forest). It is often seen persisting in patches of relic forest and as a single tree left in derived grassland or farmland.

It grows at 1500-3000 m altitude in areas with 1200-1800 mm rain per year. It prefers a warm and humid climate, in dry areas plantations fail. Tolerates moderate frost but not drought.

Uses

The attractive yellow or yellow-brown timber is popular for the manufacture of fine furniture. It is of high quality with very fine grain, the density varying from 480 to 599 kg/m^3 at 12-15% moisture content. The timber is also used as standard building timber, for flooring and roofing and it is suitable for firewood. The bark contains 3-6% tannin and is used for tanning leather, the fruit is edible and oil from the seeds is used for medicinal purposes. The large, dense crown makes it suitable for shade and windbreaks and the attractive shape has made it popular as an ornamental tree in cities. In some countries it is used as a Christmas tree instead of pine or fir. In the natural environment the species is an important provider of nesting sites and food for a number of bird species.

Botanical description

A medium to large tree, up to 60 m tall but quite smaller if planted. The bark is rather thin and smooth, grey or brown, on older branches flaking in irregular pieces. Crown is dense, pyramid-shaped and symmetrical. Leaves are 3-5 cm long, narrow and often sickle-shaped, twisted at the base so that the leaves are held upright. The plants are dioecious (female and male flowers on different trees). Male cones are small, about 10 x 3 mm, positioned in leaf corners 1-3 together. In the female structure usually only one seed is produced at the end of a woody stalk.

Fruit and seed description

Podocarpus belongs to the gymnosperms so no fruit layer is produced, the seeds are borne "naked" inside the cone. Each seed is almost round and up to 2 cm in diameter. The seed resembles a drupe, with a fleshy, about 3 mm thick outer layer and a very hard, 4-8 mm thick inner layer. At maturity the seeds are of a deep yellow colour.

Natural occurrence of *Podocarpus gracilior* at Asella (approx. 2500 m a.s.l.) Ethiopia. Photo by H. Keiding, DFSC.

Flowering and fruiting habit

The trees in southern Africa flower in September to May and peak fruiting takes place from December to May. In Ethiopia fruits are ripe around March and in Tanzania in January to April. As the seeds take a full year to develop, seeds at some stage of development can be found on the tree throughout the year. Ovaries that have not been pollinated still grow to full size and empty seeds are produced. Heavy seeding typically occurs every 2-4 years. The flowers are mainly wind-pollinated and the seeds are dispersed by birds, bats and wild pigs.

Harvest

When the seeds have turned yellow and the skin begins to loosen, they are ripe. The ripe seeds are collected from the tree or from the ground soon after shedding. After lying on the ground for a short time the fruits will turn brown. Freshly collected, ripe, seeds have a moisture content around 70% (entire seed), the embryo itself around 20%.

Processing and handling

At harvest time the seeds can be at different stages of maturity and it may be necessary to after-ripen the seeds for a few days in bags that allow ventilation, e.g. sisal or jute. Care must be taken to prevent the seeds from drying out as it is very difficult to remove the skin once it has dried.

After collection, the outer, fleshy layer is removed. This is important, as it is believed the outer layer contains a substance that inhibits germination. For bulk quantities, the seeds are soaked in water for 24 hours and then pounded in a mortar. After mixing with water, the broken skin and pulp can be cleaned off. For small quantities of seed the fleshy layer can be removed with a knife. Removal of the outer layer reduces the weight to about one fourth. After cleaning the seeds are dried in the shade. After removal of the fleshy layer and after drying there are about 250 seeds per kg.

Storage and viability

The seeds tolerate desiccation down to a few % moisture content and in cold store (4-5°C), they will maintain high viability for several years. At ambient temperature the seeds cannot be expected to store for more than six months. Furthermore, the seeds do not tolerate storage below 0°C.

Dormancy and pretreatment

It seems the seed has two types of dormancy; a chemical, which is overcome by removing the fleshy layer and a mechanical, imposed by the hard seedcoat. The seedcoat has pores and water can enter into the seed but the hardness restricts germination. To ensure a high and even germination the seedcoat must be broken and removed. This can be done in a vice but it is very time-consuming. Freshly collected seeds will normally germinate well, up to 60% in nine weeks, even with seedcoat but once the seeds have been dried, germination can take more than six months unless the seedcoat is removed. Some reports say that soaking in saturated salt water just before sowing can improve germination. Others recommend stratification between two layers of compost for 3-5 days in order to weaken the seedcoat.

Sowing and germination

The seeds are sown directly in nursery bags or in seedbeds in a mixture of compost and sand (1:1). The seed must be pushed into the mixture and covered with a fine layer of soil. The mixture must never be allowed to dry out.

Vegetative propagation by cuttings is also possible. The cuttings should be taken from end shoots (as opposed to cuttings from lateral branches and shoots) in order to produce plants with upright growth.

Seed of *Podocarpus falcatus* from Tanzania. The seed on the left has been cut through. (NB. grid has 1 cm divisions). Photo by Dorthe Jøker, DFSC

Selected readings

Msanga, H.P. 1998. *Seed Germination of Indigenous Trees in Tanzania*. UBC Press, Vancouver, BC.

Palgrave, K.C. 1977. *Trees of Southern Africa*. Struik Publishers, Cape Town.

Retta, S., L. Demalash and K. Poulsen. **1997**. *Podocarpus gracilior trials in Ethiopia.* The Project on Handling and Storage of Recalcitrant and Intermesiate Tropical Forest Tree Seeds, Newsletter no 3. IPGRI/DFSC.

Author: Dorthe Jøker, DFSC

Danida Forest Seed Centre
Krogerupvej 21
DK-3050 Humlebaek
Denmark

Phone: +45-49190500
Fax: +45-49160258
Email: dfsc@sns.dk
Website: www.dfsc.dk